NBER WORKING PAPER SERIES

THE CHANGING ROLE OF GOVERNMENT IN FINANCING HEALTH CARE: AN INTERNATIONAL PERSPECTIVE

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Working Paper 19439
http://www.nber.org/papers/w19439

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 2013

We thank Carolyn Tuohy, the European Health Policy Group, and particularly Janet Currie, for many helpful comments and advice. We also thank Matthew Townsend, Ellie Hukin and Katie Bates for excellent research assistance. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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JEL No. I1,I13,I18

ABSTRACT

This paper explores the changing role of government involvement in health care financing policy outside the United States. It provides a review of the economics literature in this area to understand the implications of recent policy changes on efficiency, costs and quality. Our review reveals that there has been some convergence in policies adopted across countries to improve financing incentives and encourage efficient use of health services. In the case of risk pooling, all countries with competing pools experience similar difficulties with selection and are adopting more sophisticated forms of risk adjustment. In the case of hospital competition, the key drivers of success appear to be what is competed on and measurable rather than whether the system is public or private. In the case of both the success of performance-related pay for providers and issues resulting from wait times, evidence differs both within and across jurisdictions. However, the evidence does suggest that some governments have effectively reduced wait times when they have chosen explicitly to focus on achieving this goal. Many countries are exploring new ways of generating revenues for health care to enable them to cope with significant cost growth. However, there is little evidence to suggest that collection mechanisms alone are effective in managing the cost or quality of care.

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I. Introduction

A large part of the recent debate over health care reform in the United States focused on how much government involvement is appropriate in the health care sector. Nations across the OECD ensure universal access to health care for their citizens through national or regional risk pooling financed by mandatory income-related contributions (premiums). Ensuring universal protection against the costs of health care and controlling public expenditures requires a significant degree of national or regional management -- a common feature across these countries. Yet no two health systems are identical and OECD countries achieve this goal in a variety of different ways. Many health systems make substantial use of market mechanisms, for example, despite having extensive public funding and regulation.

This paper explores the changing role of government involvement in health care financing policy outside the United States. It provides a review of the economics literature in this area to understand the implications of recent policy changes on efficiency, costs and quality. Economists and health policy researchers have written extensively on the differences in health care costs and coverage rates across countries. In these two areas – share of GDP (gross domestic product) spent on health and share of people without any form of health coverage – the US has long been an outlier. However, while there are many similarities across 'the rest' of the countries in the OECD there are also substantial differences in policy design. In addition, significant policy changes in the last ten years have in some cases led to a degree of convergence with the US. Examples include the introduction of a universal mandate in the United States, the move towards a competitive health insurance market in Germany and the Netherlands, and the adoption of market-like mechanisms such as activity-based funding to pay hospitals, selective contracting, and provider competition.

To better understand how OECD health systems both differ from and have converged towards the health system in the United States over the past decade, and to organize the vast literature on financing health care, we specify three financing functions present in any health system, whether made explicit or not: raising revenue for the health system (collection); pooling risk; and purchasing services (Kutzin, 2001). A fourth dimension – making coverage decisions (whom, what and how much to cover) – cuts across the three functions, as shown in Figure 1. We use this framework to explore the economic literature on the relationship between the financing functions and health system performance, drawing on recent work from the United States when appropriate.

There are other useful ways of characterizing health systems. For example, Reinhardt's taxonomy of the components of health systems distinguishes between government, not-for-profit and for-profit on the production side and social insurance, private insurance and no insurance on the financing side (Reinhardt, 2009). We use Kutzin's framework for the following reasons. First, it allows for a comparison of any type of health system, and avoids the use of traditional labels (e.g. 'tax financed' or 'social insurance'). This has the advantage of revealing rather than obscuring vital similarities and differences between systems in the way that many classifications do. Second, it enables us to get away from terms such as 'private' or 'public', shifting the emphasis onto differences in how countries carry out the functions as opposed to differences in the legal status of the agents

responsible for collection, pooling and purchasing. Third, it allows us to focus the review on functions rather than on tools and goals. While many countries include equity, for example, among the goals of the system, this goal is affected, under each function, by the nature of the tools in use. Similarly, taxes and regulation are widely used tools rather than functions of the health care financing system. Fourth, the framework highlights how health financing functions are more or less independent of each other; decisions about how to pool risks and purchase services can be made irrespective of how revenues are raised.

The research goals for this paper, then, are to explore the economic implications of the different ways in which OECD health systems carry out the financing functions, how policy changes have resulted in more market forces within these jurisdictions, and the effects of these changes on system efficiency, costs, and outcomes (quality). We do not review or evaluate the literature examining the justification for government intervention in the health sector because the government plays a major role in financing health care in all OECD countries, including the United States. Also, while we analyze the efficiency and effectiveness of a number of policy interventions on particular populations, we are often unable to make claims about the overall welfare implications of government intervention in the countries we examine.

Our review reveals that there has been some convergence in policies adopted across countries to improve financing incentives and encourage efficient use of health services. In the case of risk pooling, all countries with competing pools experience similar difficulties with selection and are adopting more sophisticated forms of risk adjustment. In the case of hospital competition, the key drivers of success appear to be what is competed on and measurable rather than whether the system is public or private. In the case of both the success of performance-related pay for providers and issues resulting from wait times, evidence differs both within and across jurisdictions. However, the evidence does suggest that some governments have effectively reduced wait times when they have chosen explicitly to focus on achieving this goal.

The rest of the paper is organized as follows: we begin with a brief overview of the countries we consider in this review. We then explore the economics literature outside the United States for each of the financing functions listed above, examining the consequences of public policy choices made around financing health care. We review the theoretical literature where it guides differences between the United States and other jurisdictions, although our focus is on the empirical economic analysis of health care financing policy choices internationally. We then summarize the implications of the evidence and offer some general conclusions.

2. Background information on selected countries

Although we have no strict criteria for a country's inclusion in our review, we restrict our focus to recent literature on health care financing published in economic journals in English. As a result, a large amount of the work reviewed here focuses on a small number of countries: Australia, Canada, France, Germany, Switzerland, and the United Kingdom.

Figure 2 compares the financing mix in these countries and in the United States in 2011 or the most recent year for which data are available. It shows how all seven countries use the full range of financing mechanisms. Public finance (general and earmarked taxes) dominates and its share has grown slightly over time in all except Germany. The UK relies most heavily on general taxes followed by Canada and Australia, although the extent of the difference between the countries is partly an artifact arising from the way in which the data are presented. Statutory health insurance (SHI) funds (funds that are compulsory and enforced by law) in most European countries obtain some of their revenue from other tax sources in addition to payroll taxes. Internationally, health financing data are broken down by expenditure agent rather than by collection mechanism. This has the effect of obscuring the true 'source' of public revenues for the health sector. In countries in which purchasers are statutory health insurance funds, some non-payroll tax revenue is invisible in international statistics, even when it may be substantial; in France it accounts for over a third of SHI revenue (Chevreul et al. 2010). The corollary is that payroll tax revenue may not visible in countries where central government agencies pool funds and purchase health services; in the UK it accounted for almost 20% of National Health Service (NHS) revenue in 2007, the latest year for which this figure is available (Boyle 2011).

OECD data indicate that six out of the seven countries enjoy universal coverage (Table 1a). The basis for entitlement to statutory coverage varies across the countries and has changed over time within countries. Entitlement is based on residence in England, Canada, Australia, and France, while Germany and Switzerland employ universal mandates. Universally compulsory coverage is a relatively recent development in France, Germany and Switzerland. Switzerland introduced compulsory universal coverage in 1996 to address concerns about unequal access to health insurance, gaps in coverage and rising health expenditure (Crivelli 2013 in press). Before 2000 statutory health insurance in France was compulsory for workers and their dependants and voluntary for everyone else; those who could not afford to pay the fixed (non-income-related) contribution for voluntary coverage relied on locally administered government subsidies (Chevreul et al. 2010). In 2000 France broke the link with employment and extended income-related contributions to all residents, with free access to health insurance for those with very low incomes. In 2009 Germany introduced compulsory universal coverage to stem the growing number of uninsured people (van Ginneken and Busse 2009), but it maintained the link between statutory coverage and employment.

Germany is the only OECD country to allow higher earners to opt out of contributing to the statutory health insurance scheme and be privately covered instead. Voluntary (private) health insurance plays a range of roles across the seven countries, as shown in Table 1a. With the exception of the US, however, its contribution to total spending on health does not exceed 15%. Measured in terms of contribution to total spending on health, France, Germany and Switzerland have three of the four largest markets for voluntary health insurance in Europe (Thomson and Mossialos 2009).

Collection agents for the dominant public financing mechanism range from national tax agencies in England, Canada, and Australia and the national social security agency in France, to individual health insurance funds in Germany and Switzerland. Almost uniquely in Europe, Swiss health insurance funds are free to

set their own contribution rates (Thomson et al. 2009) (Table 1b). In contrast, contribution rates in France and Germany are determined by central government, long the norm in France but a recent development in Germany (introduced in 2009) (Ognyanova and Busse 2009). Switzerland is unique in two other ways. First, it uses community-rated rather than income-related contributions to finance statutory coverage, and these can vary significantly across funds, even in the same Canton (region). Second, it requires all citizens, including dependent adults and children, to pay premiums, whereas in France and Germany statutory health insurance automatically covers dependents at no extra cost to the household. France also exempts adults with annual taxable incomes below €9,020 from paying contributions (about 2.3% of the population in 2006) (Chevreul et al. 2010).

To secure financial protection for low-income households the Swiss Cantons operate a system of premium subsidies within parameters defined by the federal government but with leeway to set eligibility thresholds for subsidies and to determine the magnitude of subsidies. Until recently, the federal government used a system of matching grants to encourage Cantons to offer a minimum level of subsidy. In spite of this, there can be large differences across Cantons in eligibility for subsidies and household premium costs (Thomson et al., 2013). The other countries avoid the need for administratively complex and potentially inequitable subsidies by imposing a national contribution rate and linking contributions to income.

As in the US, people in Germany and Switzerland have choice of health insurer for publicly financed benefits (Table 1b). Insurers compete for enrollees and are subject to some form of risk adjustment mechanism, to lower their incentive to select risks.

In terms of health care delivery, patients in all of the countries can generally choose their physician and hospital. Gatekeeping (the requirement for a referral for access to specialist care) is widely encouraged, often through financial incentives. All seven countries have experimented with different ways of paying providers. Fee-for-service payment of physicians continues to dominate in all except England, while activity-based funding through diagnosis-related groups (a system which classifies hospital cases/procedures into groups and then assigns payment prices for these groups, commonly referred to as DRGs) is rapidly becoming the norm for paying hospitals. Efforts to link provider payment to performance feature in all except Canada and Switzerland.

3. Generating and Collecting Revenue

How systems transfer money from individuals to providers has implications for the efficiency of both the health system and the economy through employment effects and dead weight loss. It also affects financial protection for individuals against loss and the pooling of risk and may also affect the rate of growth of health care costs and the responsiveness of the health system to changes in economic activity. Publicly financed health care is usually generated via two collection mechanisms - general taxes and earmarked taxes (often referred to as social insurance contributions, particularly when levied on wages) – and often supplemented by user fees. General taxes and social insurance contributions affect

the medical sector directly only because of political economy considerations, while user fees will have direct effects on the medical sector. This section first considers the relative efficiency of general taxes versus earmarked taxes then looks at user fees. The major empirical findings are highlighted in Table 2.

General and Earmarked Taxes

The relative efficiency of different types of taxes used to finance health systems has been explored in the public finance and health economics literature. The equity and efficiency properties of general taxation (c.f. Auerbach, 1985) do not differ depending on whether the money is spent on health or education per se, although if the level of government that collects revenue differs from the level of government that provides health coverage there may be equity issues and issues about whether the level of taxation best meets local demand for the services required (c.f. Ahmad and Brosio, 2006). Of course, the amount of deadweight loss associated with any revenue generation will depend on the balance and type of taxes used to raise the revenue. Once again, standard public finance theory on the relative deadweight loss of income versus payroll versus consumption taxes apply, regardless of the good being purchased with the revenue (Sandmo, 1976).

Economic theory on the relative efficiency of social insurance contributions versus general taxes suggests that where the contributions are applied to an entire population or group, without option, and without direct linkage to the benefit received, the contribution is equivalent to a tax (Blomqvist, 2011). If the contribution program is directly related to the benefit program, then only the difference between the contribution required and the value of the benefit received will be treated as a tax. Although the public finance literature outlines the inefficiencies inherent in earmarked funding, if contributions are earmarked for health care there may be political economy reasons (such transparency and greater protection from political interference) why voters prefer them to taxes (Mossialos and Dixon, 2002).

Some systems mandate individuals to obtain coverage through a network of insurers and may allow insurers to collect some or all of the revenue. In such cases part or all of the contribution may be levied in the form of a community-rated premium rather than as a proportion of income. There may be a single risk pool or multiple risk pools with or without public subsidy (we turn to this issue in more detail later). Whether government collection of revenues is superior or inferior to other mechanisms for ensuring financial security such as mandating coverage depends on a number of factors (explored in Summers, 1989). First, mandates and taxes on labor can affect the level of employment and wages. The extent depends on the supply of and demand for labor and consequent deadweight loss. Mandates, if they are implemented as benefits per worker, will operate similar to a lump sum tax. If certain types of employment are exempt (such as part-time work) mandates may have large effects on the demand for full-time versus part-time work. Second, health coverage leads to an income effect, the size of which depends on the individual's valuation of the health coverage. Third, the governance of public insurance is subject to the usual political economy problems of government.

Gruber (2000) provides a simple formalization of this analysis that is useful for understanding the employment effects. Suppose labor demand, $L_{d,}$ is given by:

$L_d=f_d(W+C)$

where W is wages and C is insurance cost; and labor supply given by:

$L_s=f_s(W+\alpha C)$

where αC is the monetary value that employees place on health insurance. In this case α is the valuation of the marginal dollar of health insurance. Then it is the case that:

$$\frac{\partial W}{\partial C}=\frac{-\eta^d-\alpha\eta^s}{\eta^d-\eta^s}$$

where η^d and η^s are the elasticities of demand and supply for labor. Gruber notes that this equation differs from the standard incidence of a tax on labor by the term $\alpha\eta^s$ which "captures the increase in labor supply due to employee valuation of more expensive insurance" (Gruber, 2000, p. 660).

Valuations of α<1 may be more likely under publicly provided coverage or mandates as contributions to the system are typically disconnected from benefits received. This disconnect occurs whenever redistribution is an important element of the public insurance arrangement and is minimized if benefits are valued at their full cost. Where insurance is provided even if individuals do not work, then the valuation of the benefit (α) will be closer to 0 than if benefits are only available to workers (depending on any difference in coverage between workers and non-workers) and the cost will have a larger negative effect on employment.

Given that mandated insurance can be less redistributive than publicly provided coverage, does not necessarily involve centralized revenue collection, and does not generally involve government provision of insurance or services, it is arguable that these inefficiencies are smaller for mandates than for publicly provided insurance. Summers (1989) therefore concludes that mandates are to be preferred to public provision. On the other hand, transaction costs and the effectiveness of mandates may be a matter of concern. A variety of other economic and political factors, including a desire to redistribute through the health insurance system, may cause systems to deviate from the theoretically superior outcome.

Many health systems explicitly or implicitly aim to redistribute income from higher- to lower-income individuals. The extent of this redistribution is a not a priori related to the financing mechanism used, although health systems financed through general tax revenues tend to be more redistributive in practice than those financed through social insurance contributions and those that are more privately financed (Wagstaff et al, 1992; Wagstaff, 2010). Payroll contributions are often capped, unlike income taxes, and if they are progressive instead of proportional, they tend to have smaller increases in the marginal rate as they move up the income scale. Another important element of the extent of redistribution will be the utilization of the system by high- versus low-income

individuals. Once differences in access and life expectancy are taken into account, it may be the case that the marginal dollar allocated to health care is less redistributive than a dollar allocated to education or income assistance because higher income individuals are likely to live longer and therefore benefit more from the publicly financed health care system (Glied, 2008).

There is a long-standing debate in the literature on whether health systems financed through general tax revenues are better able to control health care costs than those financed through social insurance contributions, and on the relationship between financing structure and health outcomes. One of the difficulties with the literature is that characterizing a health system by its primary source of finance is akin to painting with an extremely large brush. No two tax-financed or social insurance-financed systems are alike; for example, the UK and Canada are both tax financed, but there are few other similarities. In one recent study, Wagstaff (2009) uses system changes from general tax financing to social insurance within OECD countries between 1960 and 2006 to examine whether social health insurance leads to increased or decreased cost growth. Looking at changes within countries over time potentially overcomes the problems of comparisons across very different systems. However, large changes in financing are somewhat rare, and may be a function of other underlying economic conditions also related to public spending. To try and account for the fact that switching is potentially endogenous, these models include both difference-in-difference models and IV models (using lags of the social insurance indicator variable as an instrument). The findings suggest that there is an increase in health care costs of 3 to 4 percent associated with a move to social insurance and that this move is related to a decline in formal sector employment of 8 to 10 percent. Some of the decline in formal sector employment may simply involve a shift to non-formal employment (presumably to avoid the costs associated with social insurance premiums in formal employment settings) as the estimates on overall employment levels are smaller and less robust. The study finds no evidence that the transition to social insurance results in declines in avoidable mortality (deaths from specific conditions, such as diabetes, which should not occur if timely and effective care is available). The results are driven by those countries which transitioned from social insurance to tax financed or vice versa, including Denmark, Sweden, Italy, and Spain who moved away from social insurance, and a number of eastern European countries who moved toward it.

A related paper (Wagstaff and Moreno-Serra, 2009) uses a similar methodology to look at a different set of countries and time period. They examine transitions between one financing structure and another among Eastern European and Asian countries between 1990 and 2003. These transitions were relatively large and fast compared to the slower evolution of more developed health care systems. They find even larger results for the transition from general tax-financed to social insurance financing. Their estimates of increases in spending per capita are in the order of 11 percent, with a 3 percent increase in inpatient admissions (although average length of stay declined). Once again, there was no evidence of differences in health outcomes as a result of financing transitions. Wagstaff and Moreno-Serra suggest that physicians in these countries saw the transition as an opportunity to increase resources in the system and therefore their incomes which may help explain some of the results. They also hypothesize that the transition to social insurance lead to less integrated systems leaving some people

slow to sign up for insurance and others not captured by prevention programs, both potentially leading to increased overall costs. However, the fact that they find no overall change in outcomes suggests that the magnitude of these types of effects must have been fairly small.

A recent paper by Cylus et al. (2012) explores the relationship between collection mechanism (tax-financed versus social insurance) and the relationship between economic downturns and health care spending. Using OECD data on within country variations for several European countries, the authors estimate models of the relationship between changes in GDP and changes in public health care expenditures. They find that growth in public health care expenditures is more strongly associated with changes in GDP (positively) in tax-financed countries than in countries primarily funded through social insurance contributions. The results stem from cost shifting and other policy changes in tax financed-countries that occurred in economic downturns. While policy responses to economic crises are clearly possible in social insurance countries as well, cost shifting (mainly onto users) did not occur to the same extent. The authors hypothesize that tax-financed countries are, in general, more susceptible to government decisions to reduce costs in times of economic crisis.

Finally, recent work by Baicker and Skinner (2011) models the efficiency of raising revenues to finance rising health care costs in the US (and elsewhere as health care costs are rising more quickly than economic growth in many OECD countries). The authors develop a macroeconomic model that accounts for increases in health care spending that improve longevity but need to be funded through increased taxation. In a comparison of raising revenue through increased marginal tax rates versus less progressive payroll tax, they find substantial declines in economic growth with the former: an 11 percent decline in GDP relative to the baseline of no distortionary impact of tax financing. The efficiency costs are lower when less progressive taxes are used to finance the increase in costs, although this is associated with lower income individuals paying a larger share of the overall costs. Not surprisingly, the efficiency cost is also lower when less revenue is required to achieve the same health gains (increased productivity of health spending).

Cost Sharing and User Fees

The third collection mechanism used in a variety of health systems is user charges or fees (co-payments and other forms of cost sharing). These generally consist of some form of positive price charged to the user at the point of service and from an economic theory point of view can all be modeled as consumer prices (Schokkaert and Van de Voorde, 2011). User fees generally have two purposes, first as a mechanism for revenue collection, and second as a mechanism to achieve a more efficient allocation of resources. Regarding the second, allocative efficiency, several studies (c.f. Pauly, 1974) have shown that in the presence of moral hazard, the optimal theoretical solution includes some cost sharing for some services. The principal problem here is that the individual has information and control over future health states that the insurer cannot observe. This moral hazard problem results in the individual consuming excess care and taking less preventative action. The optimal solution in this case is for the insured individual to retain part

of the losses (Pauly, 1974). Others have argued that for non-elective procedures cost sharing may lead to inefficient outcomes as individuals place a high value on the care purchased from insurance payouts when ill. In this setting individuals purchase insurance not to avoid risk necessarily, but for a claim on additional income when sick (Nyman, 2003).

In the case of cost sharing for the purpose of revenue collection, it is not clear, given the administrative costs involved, and the equity considerations, that user fees are an optimal means of supplementing taxes and contributions in developed health systems. Schokkaert and Van de Voorde (2011) note that strict assumptions about the limitations of public financing mechanisms for the health care budget are required for user fees to be optimal as a part of the revenue-raising basket, namely that that government subsidies remain fixed in the presence of user fees (i.e. that government funds are not crowded out) and that the additional revenue is used to increase the quantity or quality of health services.

International evidence on the effects of various forms of user fees as a supplemental collection mechanism is consistent with theory and evidence from the United States. Evidence from Canada, for example, which examines how individuals who need to pay out of pocket for prescription drugs use care relative to those who do not, suggests a negative demand elasticity in the order of those found in the RAND experiment (around -0.2 for prescription drug coverage) and greater use of publicly financed doctor services (Finkelstein, 2002; Stabile, 2001). Evidence from Canada that examines increases in user fees for prescription drugs also finds negative health effects and increased emergency room use for older and low-income users (Tamblyn et al., 2001). Evidence from France, where voluntary health insurance reimburses user fees for publicly financed services, suggests that voluntary insurance increases utilization and, therefore, publicly financed costs (Buchmueller et al., 2004). The relationship between out-of-pocket prices and utilization holds in a number of other countries in the OECD and across a broader spectrum of low- and middle-income countries (Gertler and Hammer, 1997). Using the introduction of referenced based pricing in parts of Canada as a quasi-experiment (where a fee is applied to a user if he/she chooses a drug in the same class as the reference drug but at a higher cost), Grootendorst and Stewart (2006) find only modest declines in overall drug expenditure when comparing changes in expenditures in the province that introduced referenced-based pricing to those that did not. However, the authors note that part of the reason for the small behavioral response found here may be that the policy was either not applicable or not binding for many users, limiting the potential for savings. There is some evidence of movement towards strategies that promote efficiency through value-based cost sharing (using cost sharing to encourage patients to use medication, services, and providers that offer better value than other options) rather than simply applying user fees across the board (Stabile et al, 2013).

Overall, the evidence summarized above and reported in table 2 reveals policy changes across countries to improve financing incentives and encourage efficient use of health services. The evidence suggests that collection mechanisms alone are not effective in managing health care costs or quality. Some evidence suggests that financing through social insurance is associated with higher cost growth over time than financing through general tax revenues, but public

spending on health tends to track GDP more closely (particularly in recessions) in tax-financed systems than in systems financed through social insurance.

4. Pooling Risk

This section examines the literature on options for pooling risk and managing adverse selection and implications for health system efficiency and costs. The major empirical findings are highlighted in Table 3. Problems with adverse selection have long been recognized in the health insurance literature. Individuals with higher expected costs will be more likely to seek more generous insurance, and insurance providers in a voluntary competitive market will need to price insurance offerings at costs above the average value of the benefits package to offset the higher expected costs of both benefits and selection (Cutler and Reber, 1998). This can result in benefits packages that are unaffordable for many high-cost individuals. Risk pooling designed to counter these concerns has been a primary objective of many health systems. Since information about individuals' health insurance costs is imperfect and asymmetric, perfect risk adjustment across individuals is unattainable. Second-best solutions in the presence of imperfect information lead to a number of potential problems in practice, including residual selection, blunted incentives for providers to manage care, a misallocation of individuals across plans, or a reduction in choice of insurers and type of coverage.

The theoretical literature on risk pooling offers a number of strategies for dealing with adverse selection given imperfect information. One obvious solution is for governments to create a single, mandatory pool or to have multiple pools but without competition and choice between pools. While the clear upside to these solutions is the elimination of adverse selection problems, there may also be efficiency costs due to the uncompetitive nature of the insurance market.

Governments that wish to preserve universal access to insurance without using a single pool or eliminating consumer choice of insurer can pursue a set of alternate strategies to manage risk selection. They can provide subsidies to individuals - cash transfers, vouchers, tax-favored treatment, tax credits, etc - to enable them to purchase high-cost insurance. van de Ven and Schut (2011) note that premium subsidies are unlikely to be optimal for three reasons: they reduce the incentive for efficient purchasing of insurance by high-risk individuals; they encourage excess purchase of insurance and the resulting moral hazard effects (Zweifel and Manning, 2000); and they may create a misallocation of subsides if the magnitude of the premium is based on elements that are not relevant for the level of the subsidy (such as differences in efficiency among health insurers or regional differences in prices). In contrast, risk-adjusted subsidies, where payments are based on observable risk factors such as age, sex, and health status, retain consumer price sensitivity and can be adjusted over time to reflect changes in consumer risk (van de Ven, 2006). Risk-adjusted subsidies can be given to individuals or to insurers. Alternatively, governments can regulate rates and insurance plan features and then compensate plans for the expected risk pool after the fact (van de Ven and Ellis, 2000).

Where subsidies are provided by government to the insurer, individuals are then charged a community-rated contribution for insurance that is not based on their expected costs. van de Ven and Schut (2011) refer to subsidies provided

to insurers as risk equalization and note that these are far more common in practice than subsidies provided to individuals, due to lower transaction costs. The ultimate success of these risk adjustment mechanisms depends on ability to determine risk (van de Ven et al., 2000). Glazer and McGuire (2000) show that in an optimal risk adjustment framework, prices paid to insurers should not only reflect differences in costs across patients, but also provide incentives for higher quality care for the types of patients likely to enroll in the plan. Under this type of framework, risk adjustment payments would overpay insurers relative to payments based solely on average costs (Glazer and McGuire, 2000).

Brown et al. (2011) show that firms will respond to risk adjustment models by a) reducing their screening efforts along the dimensions included in the model and b) selecting patients conditional on risk adjustment and based on characteristics not included in the risk adjustment formula. These efforts can result in increases rather than decreases in the differential payments (the original payment given to the insurer to cover someone minus the counterfactual costs if the government had covered the costs for the person) which would be counter to the objectives of the government in providing the risk adjustment to the insurer.

The European health systems in this review with competitive health insurance - Germany and Switzerland - have significantly improved their risk equalization schemes in the last ten years and now have relatively sophisticated formulas that include health-based risk adjusters (Thomson et al, 2013). In spite of this, insurers' incentives to select risks can be substantial and there continues to be (largely circumstantial) evidence of risk selection (van de Ven et al, 2007) and hence potential inefficiencies in risk pooling.

Nuscheler and Knaus (2005) investigate the effects of the 1996 German reforms that allowed for greater competition among sickness funds to test for evidence of risk selection by company-based sickness funds. The reforms increased the number of people switching between sickness funds from around 6 percent pre reform to 10 percent three years after the reform. The paper suggests that healthier workers had lower switching costs and therefore were more likely to switch funds (to company-based funds and regional funds, so switching may not have been due to targeted selection efforts on the part of company-based funds but rather driven by individual selection) and that company-based funds with lower premiums enjoyed a healthier pool of enrollees as a result of the reforms.

The Swiss system also promotes choice for individuals and competition among health insurance providers. Swiss residents can choose among 35 different sellers of insurance for the statutory health insurance package (Frank and Lamiraud, 2009). All individuals are required to obtain statutory coverage and, as noted above, there is risk equalization run by the state on a Canton by Canton basis. Colombo (2001) investigates the effects of consumer choice in this context and finds there is little switching behavior, with only 3.9% of people switching in a given year. Frank and Lamiraud (2009) show that switching behavior actually declines as the number of options available in the Swiss context increases.

Risk selection also can be exacerbated by the functioning of the voluntary health insurance market when consumer purchasing decisions for the two forms of insurance are linked. For example, if consumers have strong incentives to purchase voluntary insurance from the same insurer from whom they purchase statutory or compulsory coverage (for reasons of convenience or legal requirement), and if selection is permitted in the voluntary market and desirable

for insurers but difficult in the statutory market, then selection in the voluntary market may affect selection in the statutory market. This could limit consumer mobility in the statutory market. Swiss citizens are able to purchase complementary voluntary insurance to cover services excluded from the statutory benefits package such as some drugs, access to certain physicians and treatment outside the Canton of residence. Swiss insurers can sell complementary benefits to individuals that hold statutory coverage with the same insurer. In contrast to statutory plans, complementary plans are not risk adjusted or community rated. Paolucci et al (2006) review whether the complementary insurance market can be used to undermine risk adjustment across a number of jurisdictions (including Switzerland). They explore how the probability that the voluntary market will be used for selection in the statutory market varies with the strength of incentives for risk selection in the statutory market and the strength of the links between statutory and voluntary insurance and find prima facie evidence that risk adjustment in the statutory insurance market is hampered through selection in the voluntary market, particularly in Switzerland.

Additional evidence by Lehmann and Zweifel (2004) examines a major Swiss insurance company that also offers a managed care option to better understand the extent of risk selection versus innovation in explaining the cost differences between insurance options in the Swiss context. They conclude that while there is favorable risk selection into lower cost insurance options such as managed care – selection that is not fully captured by the simple risk adjustment mechanism – most cost savings are due to contractual innovation on the part of the managed-care organization.

Although the European countries have put in place numerous mechanisms to allow individuals to move easily from one insurer to another (open enrolment, full cover of pre-existing conditions, standardized benefits etc) and to facilitate insurer competition for members (the option for premium variation and risk adjustment), there is some evidence of barriers to switching for older and apparently less healthy people and, in Switzerland, of 'inertia' in the face of multiple insurance options. This suggests two things: first, choice of insurer may not be as great a stimulus to enhancing efficiency and quality as expected if insurers only risk losing low-cost individuals, and therefore do not face incentives to improve care for higher-cost individuals but instead compete only for the low risks. Second, there may be a point beyond which insurance options present information problems that lead to inertia and loss of value for the consumer. Thus, the transaction costs of insurer competition may be high for individuals and the health system.

The evidence from Germany and Switzerland reviewed above is consistent with evidence from the US Medicare market. A recent paper by Brown et al. (2011) investigates differences between traditional Medicare programs for older people and private "Medicare Advantage" (MA) programs. Despite the fact that these must be offered at the same price as traditional Medicare programs, and the fact that the government implemented differential payment to these programs based on patient risk scores, MA programs have disproportionately enrolled lower-cost individuals. Newhouse et al. (2012) also investigate recent steps taken to reduce favorable selection into MA programs, including improved risk adjustment through better use of diagnostic information on inpatient and outpatient claims forms and changes to make it more difficult to leave MA monthly

(called a partial enrollment "lock-in" that kept people in MA for the final nine months of the year). They conclude that risk selection was greatly reduced, although not to zero. Therefore, despite government intervention there is still evidence of some risk selection among insurers in the United States.

US empirical economic literature on the demand for insurance has advanced our understanding of who seeks insurance and why over the past decade. The classical economics literature worked from the premise that buying insurance is more attractive for riskier individuals. The more likely an individual is to need care, the more likely he/she is to buy insurance. For a given price, therefore, sicker individuals are more likely to buy insurance, all else equal. Einav and Finkelstein (2011) note that competitive pricing responds to the average insured individual while efficient pricing should be based on the marginal individual who is less risky than the average individual. Therefore, insurance prices tend to be too high, leading to under-insurance in the presence of adverse selection.

In recent work, however, Einav, Finkelstein and Levin (2010) find that there are a number of other dimensions to the demand for insurance beyond risk, including, importantly, risk aversion. For example, in the US long-term care market, they found that in addition to predicted use of long-term care, individuals who exhibit more precautionary behavior (through preventative measures such as seat belt use and getting flu shots) are more likely to buy long-term care (advantageous rather than adverse selection), and less likely to use long-term care, thereby eliminating adverse selection in this market (Finkelstein and McGarry, 2006). Fang et al. (2008) also find further evidence of "advantageous" selection in the US Medigap insurance market, along a number of non-health or risk-related dimensions. Similar results are found in voluntary health insurance markets in European countries (Bolin et al., 2010). In light of this empirical evidence, Einav, Finkelstein and Cullen (2010) estimate the efficiency consequences of selection in the context of a large firm and find only modest welfare costs from adverse selection. Thus, while all of the studies reported find evidence of some adverse selection, the extent of this selection, and the presence of advantageous selection in some cases, suggest that the welfare loss traditionally associated with adverse selection may be less than previously thought and that concerns about it may have been overstated.

In conclusion, the evidence reviewed above and summarized in Table 3 suggests that countries with competing pools experience similar difficulties with selection and are adopting more sophisticated forms of risk adjustment. The nature of the market for voluntary insurance can play a role in exacerbating selection. Recent evidence suggests that more detailed data on use, coupled with restrictions on ability to change insurer, can significantly mitigate risk selection.

5. Purchasing Services

All health systems require the purchase of a wide range of goods and services provided by hospitals, labs, pharmaceutical companies, physicians and other care givers. The purchasing function may be carried out by government agencies, insurers, groups of doctors acting on behalf of patients or patients

themselves. It involves decisions about what services to buy, from whom, at what price and under what conditions. Many OECD health systems have experimented with policies intended to strengthen the purchasing function by moving away from passive reimbursement of providers. Common tools adopted in recent years include hospital competition, activity-based payment for hospital services (or Diagnosis Related Groups, (DRGs) a system which classifies hospital cases/procedures into groups and then assigns payment prices for these groups) and the linking of provider payment to performance and outcomes (pay-for-performance, P4P). We review the literature on recent innovations in hospital competition and provider payment below, and summarize the empirical literature in Table 4.

Hospital Competition

The National Health Service (NHS) in England has, in the last twenty years, engaged in several experiments to foster patient choice of hospital and encourage hospital competition. The extent to which hospital competition improves quality or prices may differ depending on the nature of the market. For a thorough review of the nature of competition in health care markets and a summary of the recent research in this area, see Gaynor and Town (2011). In many markets prices are set by regulators, leading to non-price competition based on quality. Hospital quality is inherently hard to measure and has multiple dimensions. Some dimensions, such as waiting times are relatively easy to measure. Others, such as risk-adjusted mortality can be more difficult to quantify. The theoretical effects of competition under fixed prices are increased quality, with a greater effect where there is a larger number of firms in the market; quality will also increase as regulated prices increase (Gaynor and Town, 2011). Propper et al. (2004) and Propper et al. (2008) argue that in markets with stricter budget constraints (generally where there are large government purchasers or where purchaser budgets are determined by governments), prices will be relatively more important and therefore hospitals will compete on prices instead of on quality. The theoretical effect on quality in this case is indeterminate and may result in quality below efficient levels.

Evidence from a variety of reforms in England are generally consistent with these predictions. In the early 1990s the creation of an internal market through a purchaser-provider split allowed District Health Authorities (DHAs) with responsibility for meeting the health needs of their local population to purchase services from hospitals. The aim was to make hospitals compete for the business of DHAs and of groups of GPs who held funds to purchase care for their patients ("GP fundholders"), thereby improving efficiency and quality. Following a change of government in 1997, the purchaser-provider split remained in place and new geographically defined primary care trusts (PCTs) were set up to purchase services from primary care providers and hospitals. In the mid 2000s, the government experimented with a variant of GP fundholding known as practice-based commissioning (Bevan and van de Ven, 2010). And in 2013 a new government established clinical commissioning groups to facilitate purchasing by groups of GPs.

Propper et al. (2004) examine the effects of hospital competition on mortality. They define catchment areas for each hospital, capture the number of

hospitals in each area, then weight this measure by the population each area serves. Their findings suggest that increased hospital competition reduced quality; hospitals located in areas with more competition had higher death rates than those in areas with lower levels of competition, controlling for observable differences in patient and hospital characteristics. The size of the effect is small but robust. In a follow-up study, however, Propper et al. (2008) note that where outcomes are easily observable (wait times), hospitals had to compete on both price and quality (wait times) and competition led to improvements, but at the expense of quality measures that are more difficult to observe. Other evidence reviewed in Bevan and van de Ven (2010) suggests that NHS hospitals increased productivity and that while wait times appeared to improve under GP fundholding there did not appear to be much evidence of a reduction in costs.

The GP fundholder model was in place from 1991 to 1999 when it was abolished. Dusheiko et al. (2006) use this policy reversal to examine the effects of supply-side cost sharing on physician behavior. They find strong evidence that GP fundholding resulted in a decline in secondary admissions (as would be predicted by the theory). They find no evidence that the result of this was a substitution of emergency admissions for elective admissions through a GP. This suggests that incentivizing the gatekeeping function of GPs does result in less utilization, potentially resulting in worse care for patients. However, we review other effects of the reforms below (such as improved wait times for patients who were in GP fundholder groups) and a complete analysis of the welfare effects of such policies would need to take into account the combined effects.

Further reforms in England sought increased patient choice of the location, time and day of elective surgery to reduce waiting times and improve quality through competition, with money "following the patient" (DRGs) (Dixon et al, 2010). The reforms, commonly referred to as "Choose and Book", were slow to get off the ground. Dixon et al. (2010) report that as of 2008, less than half of GP referrals for outpatient appointments used the new system. Gaynor et al. (2010) examine evidence of increased consumer choice through "Choose and Book" and the introduction of DRGs. Using discharge data and comparing variation in market structure across hospitals through market concentration, they found that hospitals competed on quality, resulting in improvements in mortality and length of stay. In a follow-up paper (Gaynor et al., 2012) the authors estimate a structural demand model using data from the same reforms for coronary artery bypass graft (CABG) surgery. Their estimates confirm that reforms giving patients choice of hospital increased patient elasticity of demand with respect to service quality. They found considerable heterogeneity in their estimates, with sicker patients responding more to the reform, but did not find significant response differences by income (Gaynor et al., 2012).

Cooper et al. (2010) also examine the effects of increased competition in the NHS using a difference-in-differences approach with "exposure" to competition and time as the two differences. They find that while increased competition among public sector hospitals improved productivity through shorter length of stay (particularly for pre surgery), competition between public and private hospitals had the opposite effect, with post-surgery length of stay increasing in public hospitals as a result of competition (pre-surgery lengths of stay remained relatively unchanged). The authors offer patient selection (less

complicated patients being drawn to the private sector) as an explanation for these differing effects.

Evidence from Australia also suggests mixed benefits from increased competition in a context where public and private hospitals are competing for patients and have multiple payers (both government and private insurance). Australia has a relatively high share of procedures in private hospitals, at around 30% of all inpatient admissions, and high levels of private insurance coverage, at around 45% of the population (Palangkaraya and Yong, 2013). In a setting where public hospitals and private hospitals compete on price and quality, Palangkaraya and Yong (2013) examine the effects of hospital competition on mortality and readmissions using hospital discharge data. Their evidence suggests that competition has mixed effects on quality: a small increase in mortality but a larger decrease in unplanned readmissions. However, the research setting here does not allow for quasi-experimental control for other factors that may be associated with greater competition, which might bias the results.

Once again, the evidence from the UK and Australia is consistent with evidence from the introduction of drug coverage through Medicare Part D in the United States. Research there suggests that the mechanisms used by government to purchase prescription drugs, i.e. moving patients from individual purchasers to members of an insured group, can have strong effects on market outcomes including lowering optimal prices (in contrast to the standard insurance finding of an increase in prices). Their findings come from insurers as part of the Medicare Part D program which bundles insurance with a formulary and group purchasing. The reasons behind this counter-intuitive result include the ability of insurance plans to bundle insurance with formularies and other mechanisms to create elastic demand. Individuals, unlike insurance plans, are not well informed about the substitutability of drugs, and doctors are generally not well informed about negotiated prices. Insurance plans, on the other hand, are able to provide rules and incentives to take advantage of both of these resulting in lower prices. (Duggan and Scott Morton, 2010).

In sum, the literature finds mixed effects of competition on quality. This may be partly due to differences in quality measures with fairly uniform evidence on the relationship between quality and wait times and more mixed evidence on quality measures that are harder to consistently measure such as risk-adjusted mortality.

Provider Payment: DRGs and Pay-For-Performance

The introduction of Diagnosis Related Groups to pay for hospital care has been a major trend across OECD countries. Expressed policy reasons for this move include increased efficiency, transparency, the ability to increase volumes for select services, and cost-containment. A review of the evidence across Europe suggests that greater use of DRGs led to an increase in admission rates and a decline in the average length of stay, as would be predicted, suggesting improvements in quality (Busse et al., 2012). Evidence on the effect of DRGs on overall system costs, as distinct from per-unit costs, is more difficult to ascertain, with some evidence of higher overall costs in France and limited evidence on costs in the UK and Germany (O'Reilly et al, 2012).

Reform of physician payment has mainly focused on linking payment to performance and the United Kingdom has experimented more substantially with P4P than any other European country. P4P was introduced to pay UK GPs in 2003, with 25% of GP income tied to meeting quality targets in a system known as the 'Quality and Outcomes Framework' (QOF) (Gravelle et al, 2008). QOF uses a list of 65 clinical quality indicators for patients in the practice. Payments are linearly related to the number of patients who achieve the indicators as a ratio of those suitable for the indicator. When patients are not suitable for the indicator they are considered "exceptions". This ensures that quality measures are not applied to those patients for whom they are not appropriate. However, it also allows GPs to exclude patients for whom they cannot reach the quality standards. Gravelle et al. (2008) investigate both the degree to which GPs are meeting quality standards and the magnitude of exception reporting using GP data from Scotland. The results suggest that over 90% of practices achieved the highest level of pay for performance and that these practices exceeded the standard required to maximize pay. Only 1% of patients seemed inappropriately excepted. However, a follow-up study by Gravelle et al. (2010) uses provider level data to test whether physicians gamed the system to take advantage of the available financial rewards by not only increasing the number of patients treated successfully but also by decreasing the number of patients eligible for treatment thereby improving their ratios of treated patients and improving their financial reward and find evidence of such gaming behavior.

In terms of the effects of QOF on patient outcomes, the evidence suggests mixed success. Campbell et al. (2007) examine the improvements in UK primary care using a longitudinal cohort study that spans the introduction of pay for performance and focuses on the management of three major chronic conditions: asthma, coronary heart disease and type 2 diabetes. While the authors note improvements in practice quality for all three of these groups over the 1998 to 2005 period, the improvements began before the introduction of QOF and are in evidence both for those clinical indicators that received financial incentives for improvement and those that did not. They conclude that QOF is associated only with a modest acceleration in improvement for asthma and diabetes.

A second investigation on the effects of QOF on quality of care by Serumaga et al. (2011) focuses on patients with hypertension. The study compares cohorts who started treatment in 2000 (several years before the introduction of pay for performance in the UK) with those who started six months before the introduction of pay for performance. They conclude that there were no changes in incidence of adverse outcomes or mortality related to hypertension as a result of the implementation of pay for performance.

More recent evidence from a hospital P4P program (Sutton et al., 2012) uses a difference-in-differences framework to examine the changes in mortality for patients admitted with pneumonia, heart failure and AMI before and after the introduction of the Advancing Quality program – a hospital based pay for performance program introduced in the north-west region of England but not in the rest of the country. The findings suggest improvements in mortality relative to the rest of the country and the authors note that in comparison to other programs that have not found such large results the program had larger bonuses and greater investment by hospitals in quality-improvement activities.

The evidence from the UK is reflected in evidence from the US. For example, in the Medicaid market, Duggan (2004) finds that government contracts with HMOs to take on Medicaid patients resulted in higher costs per patient with no corresponding improvement in (infant) health outcomes. A review of the broader literature on P4P by Rosenthal and Frank (2006) suggests that the empirical evidence in support of pay-for-performance in the US is weak. They note that among the health care studies reviewed, many show no results. They also note, however, that many of these studies were small scale interventions that may not have been picked up by physicians, and that the lack of outcomes here, therefore, may not be generalizable to larger scale interventions.

Overall there has been convergence towards more use of market-like mechanisms in OECD health systems. These include wide adoption of DRGs to pay hospitals, attempts to encourage hospital competition and, more recently, greater efforts to link provider payment to performance. The evidence on hospital competition (summarized in Table 4) suggests that where outcomes are easily observable or targeted (such as wait times) hospitals compete on price and quality (wait times), leading to improved outcomes.

6. Coverage Decisions

Decisions about whom to cover (breadth), what to cover (scope) and how much of the cost to cover (depth) may have implications for efficiency, costs, and quality. In addition to coverage decisions, governments in many jurisdictions are often able to determine how quickly to provide services. Systems with fixed budgets or other budget constraint mechanisms for health care provision generally employ price and non-price rationing to control access and costs within the publicly financed system. One of the most common non-price rationing mechanisms is to limit access to care through wait lists. Indeed, long waiting times and care rationed by mechanisms other than price are often expressed concerns in US policy debates around an increased role for government in the health care sector (c.f. Esmail, 2009). Here, we focus on coverage breadth and scope and on waiting times (given the large role it plays in the debate around rationing care), as we discussed coverage depth in the sub-section on user fees above. The empirical evidence reviewed is summarized in Table 5.

Demand For Insurance and Coverage Breadth and Scope

As all the countries that we review here have universal or nearly universal coverage, we examine the literature on the demand for insurance that complements these systems and hence helps define public coverage decisions. We do not address literature on the demand for insurance that supplements or "tops up" public coverage here[1], with the exception of the subsidies for insurance

[1] The public finance literature explores the welfare effects of allowing for private topping up of universal public benefits, comparing the effects of such a system to

through tax systems, as it does not relate directly to coverage decisions within the public system (see Thomson and Mossialos, 2009 and Stabile and Townsend, 2013 for reviews of this literature).

While doctors and hospital services are universally and uniquely covered by the provincial health insurance plans in Canada, coverage of other services, such as pharmaceuticals, dental services, and other non-hospital or doctor based care is not universal. These services are covered by a mix of private and public insurance and public subsidy, depending on province of residence, age, and income (Stabile, 2001). Several studies have looked at the financing and equity implications of this mixed public and private coverage, particularly around prescription drug coverage which has been one of the fasting growing components of health care costs in Canada over the past few decades (Alan et al, 2005).

Research on the effects of public drug insurance programs explores the equity and cost implications of changes in pharmaceutical coverage from age-based coverage to income-based coverage. In British Columbia, prior to 2003 the government provided coverage for individuals age 65 and older (similar to US Medicare). In 2003 the province switched from age-based coverage to an income - based coverage program where the amount of coverage, deductible and cost sharing varied by family income. The explicit goals of the policy change were a) to make the provincial drug program more sustainable and b) to increase fairness and equity within the drug program (Hanley et al., 2008). A review of the equity consequences of the shift from age to needs-based coverage suggests that the coverage change did result in a less regressive drug program in BC in terms of the out of pocket funds paid for drugs. This change was driven by an increase in the out-of-pocket costs paid by higher income seniors following the policy change. Although the overall effect was to make the program less regressive, the average out of pocket costs for low-income households also increased (Hanley et al., 2008).

Apart from targeted public drug insurance programs, the government of Canada provides significant subsidy for the purchase of voluntary health insurance through the tax code. Like the United States, Canada exempts employer contributions to health insurance from personal taxable income. The most recent review of these tax expenditures suggest that they are in the order of $3 billion annually (Department of Finance Canada, 2011). Research examining the implications of these subsidies on linking voluntary health insurance to the labor market suggest that there is a larger impact of the subsidies on the probability that small firms offer insurance in Canada (as well as the US) and less likely to affect the decision of larger firms to offer insurance given the other advantages (large risk pools and administrative efficiencies) available to large firms (Stabile, 2002). The evidence here suggests that in the absence of these subsidies, complementary drug coverage offered through small firms would decline significantly (in the order of 50%).

In addition to subsidizing the purchase of insurance through an employer, the Canadian system, like the US system, allows for deductions and credits for out of pocket health care expenditures when these expenditures exceed a certain

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one where individuals either choose to participate in the benefit program or opt out completely. See Currie and Gahvari (2008) for a review of this literature.

share of personal income. As with the employer deduction, the subsidy varies with the individual's marginal tax rate. Evidence exploring the effects of these subsidies also confirms significant tax-price elasticities with respect to all health care expenditures, and with respect to the purchase of voluntary health insurance (Smart and Stabile, 2005). There is no evidence, however, that these subsidies affect the purchase of health insurance on the intensive margin. This is likely because both insurance premiums and out-of-pocket spending are eligible for the tax credit, leaving the relative price of market health insurance and self insurance unchanged in Canada (Smart and Stabile, 2005). In sum, the subsidies have increased coverage rates substantially, but at the cost of significant public revenue loss and reduced equity.

Australia has also promoted voluntary private health insurance along with the public system through the use of tax subsidies through large universal rebates on private insurance purchases, lifetime community rating based on the age that insurance is first purchased, as well as tax surcharges on high earners who do not purchase private insurance. Evidence on the effects of these large subsidies on insurance take up unsurprisingly finds large increases in private insurance take up (Hurley et al, 2002) and selection into insurance by individuals who expect to be heavy users of hospital services (Savage and Wright, 2003). Additionally, the evidence suggests that the combination of tax subsidies and the effects of private systems on the health care input costs (both in the short and long run) limit the potential cost savings for the public sector (Hurley et al., 2002). The authors note that there is no conclusive evidence from Australia that shows a decline in public waiting times following the introduction of a parallel private system, nor that public costs were reduced when the overall cost of the policies are taken into account.

Economic Evaluation and Coverage Scope

Many health systems employ health technology assessment (HTA) and various degrees of economic evaluation (for example, cost effectiveness analysis) to determine what the publicly financed benefits package should cover. In addition to considering whether a particular service or treatment should be funded, assessing bodies can also consider best practices within accepted treatments to reduce harmful or costly treatment variation. HTA is not, however, unique to publicly financed insurance – all payers must decide what they will and will not pay for, and many attempt to elicit best practices from their providers to ensure quality, safety and efficiency. There is an extensive literature on methods of economic evaluation (c.f. Drummond et al., 2005, Garber, 2000). Garber (2000), building on Garber and Phelps (1997), explores the relationship between economic analysis and decision making by the insurer. Where the decision is based on the average risk in the population, the insurance company or public insurer will cover those services with the maximum net benefit. Garber and Phelps note that only those services whose expected benefits equal or exceed costs will be insured and these will be included in the premium. In the case of a government insurer, it is possible that a broader set of costs and benefits will be used in any economic evaluation, as all costs and benefits to society should be relevant. This may lead to different decisions about what to cover. The perspective of a

managed-care company, for example, would ignore producer surplus. However, given that the relevant population for government may not include producers outside the boundaries of the state this distinction is perhaps not as applicable in practice (Pauly, 1995 and Garber, 2000).

Several countries have set up bodies aimed at increasing the use of health technology assessment. For example, the National Institute for Health and Clinical Excellence (NICE) was established in England in 1999 to ensure that treatment decisions would be based on the best available clinical evidence, and many other countries have followed suit. However, evidence of the effectiveness of HTA is limited. Evidence from NICE suggests, for example, that very few appraisals of new technologies have had a negative outcome (NICE, 2010). Where NICE has recommended restricting the use of technologies, there have been some savings to the National Health Service, but part of the cost has been shifted to patients, limiting overall cost containment (Richards, 2008).

Access to Care and Wait Times

In the absence of prices as a form of demand control, the optimal wait for care will be one that balances marginal social costs and marginal social benefits. Assuming that the longer the wait for inpatient treatment, the lower the total cost of care in present value terms, then the optimal wait will depend both on total costs and the nature of the benefit curve – i.e. how the benefit of treatment changes with delay in being treated. In contrast to a market clearing price, waiting imposes a cost on the patient by delaying care; it also results in a deadweight loss as there is lost consumer surplus and no gain to the producer. Gravelle and Siciliani (2008) note that in the presence of moral hazard some wait time may be optimal, but the assumptions required for such a result to be welfare increasing include that the marginal cost of waiting be higher for patients with a smaller benefit from treatment (Gravelle and Siciliani, 2008). If wait times are required, it is optimal for those patients who face the greatest gain to receive the shortest wait and for those with no potential gain to wait an infinite amount of time. However, in the absence of perfect information, shorter wait times should be offered to those groups with higher expected gains (Gravelle and Siciliani, 2009). Therefore, whereas most private insurance schemes impose a uniform cost across all patients, publicly financed care often imposes wait times that will not be uniform, and depend instead on the potential gains from treatment and the deadweight loss of waiting.

Propper et al. (2002) investigate the relationship between GP fundholding in England and wait times. GP fundholding allowed some GPs to purchase services on behalf of their patients as part of a larger set of reforms to encourage hospital competition and lower wait times (discussed above). All transactions were within the publicly financed health care system. The authors examine hospital wait times for over 100,000 elective hospital admissions in England between 1993 and 1997. They find patients with GP fundholders waited less time, all else equal, than non-fundholder patients. The longest reductions in waits were found in those areas with the longest wait times a priori. They find limited evidence of spillover effects for non-fundholder patients or for other areas of practice. They conclude that it

was the ability to pay for shorter wait times from within the public system, and not the ability to choose the hospital for the procedure (fundholders could purchase services without specifically paying for lower waits) that resulted in shorter wait times (Propper et al., 2002).

Siciliani and Martin (2007) also examine the relationship between increased choice in NHS hospitals (through the policies examined above) and wait times using data from 120 hospitals between 1999 and 2001. They use similar measures of market concentration to Propper et al, 2004 (reviewed above) and find a modest reduction in wait times from increased competition. Their results also imply that there is an optimal number of hospitals competing with each another and that once the optimal number is exceeded (between 11 and 14 hospitals in a catchment area) further increases in the number of hospitals competing can result in increased wait times. The authors do not provide an explanation for this result, but note that the effect is modest.

Research by Cooper et al. (2009) also examines how the policies outlined above as well as increased funding by the UK government affected wait times for care. They document a steady decline in wait times for hip, knee, and cataract procedures in the NHS between 2000 and 2007 (after an initial increase in wait times). As wait times fell, the variation in wait time across socioeconomic status also fell, improving equity. While the evidence presented is not causal, and the authors do not try and link particular parts of the UK reforms to the declines in wait times and improvements in equity, they do claim that "the post 2000 government reforms did not lead to the inequitable distribution of wait times across groups that many people predicted" (Cooper et al, 2009, p. 5).

Propper et al. (2010) examine the use of targets in the UK as a tool to reduce wait times. They exploit the natural experiment generated by the introduction of targets in the England but not Scotland to identify whether target setting for wait lists led to a fall in wait times in England. They find a reduction in waiting times of 13 days on average. While levels of elective care rose to reduce wait times, they did not find reductions in non-targeted activity to offset these changes. They also find no evidence of a fall in patient quality, some evidence of an increase in the quality of care and of wait list "manipulation" whereby patients were removed either temporarily or permanently from the list. Overall the authors conclude that targets successfully lowered wait times in England, with little evidence of adverse side effects.

Wait times have been identified as a persistent policy problem in Canada as well (Wilcox et al., 2007). A few studies have tried to assess the impact of longer wait times in Canada in terms of health outcomes. A challenge in measuring the impact of longer waits is that, in addition to any health differences, there may be non-health measures such as pain or lost income or leisure that are more difficult to measure. However, much of the literature focuses on more easily measured outcomes such as length of stay post surgery, or mortality. One such study examines patients with hip fractures in Quebec admitted to hospital between 1990 and 1993 (Hamilton et al., 1996). After controlling for patient health and for both observed and unobserved individual and hospital characteristics, wait time for surgery had little effect on post-surgery length of stay or mortality. Studies in the medical literature looking at open-heart surgery (Carrier et al., 1993) similarly find little difference in post-operative outcomes. However, a study looking at wait times for admission into hospital through the emergency room (ER) in Canada

found that presenting to an ER when there is a longer wait in the ER had a higher risk of short term death or admission (Guttmann et al., 2011). The authors use a retrospective cohort study and health administrative data from Ontario to track patients who were either seen and discharged or left without being seen. They find an increase in both mortality and admission to hospital among patients who present during shifts with long mean wait times. However, patients who left without being seen were not at increased risk of adverse events.

Australia also experiences issues with wait times and the government has pushed private insurance through explicit subsidies as both a solution to long wait times and increased public expenditures (Vaithianathan, 2002). As noted above, a large number of Australians (45%) hold private insurance coverage in order to obtain faster and premium service. Johar et al. (2011) explore the extent to which the decision to purchase insurance in Australia is a function of expected wait times. Using hospital administrative data they model the effect of expected wait time for a procedure on the demand for insurance. The authors impute expected wait times using a variety of health conditions available in administrative data. Contrary to anecdotal evidence in Australia they find that the demand for insurance is insensitive to expected waiting times, although they do find that it is sensitive to wait times for the upper end of the wait time distribution. One limitation of the study is that the demand for insurance as modeled does not include a number of possible characteristics of private insurance such as access to certain doctors. It is also unclear whether perceived long wait times by individuals before they actually experience illness isn't the driving factor in people's decision to seek insurance. Evidence of the difference in wait times for people with and without private insurance suggests that privately insured patients receive much faster care not only in private hospitals but also in public ones (Johar and Savage, 2010).

There is less evidence that wait times are a problem in Germany, France, and Switzerland. An international comparison of wait times by Siciliani and Hurst (2004) suggests that there is some evidence that those countries that do not report problems with wait times spend slightly more, have higher levels of capacity as measured by number of hospital beds and doctors per capita, and have higher levels of inpatient activities. They are also more likely to use DRGs to pay hospitals (at the time the study was carried out; now most use DRGs) and fee-for-service to pay physicians. They do not find evidence, however, that countries that do not report high levels of wait times are more productive (as measured by inpatients per physician).

In sum, the evidence reviewed above and listed in Table 5 suggests that while wait times are not a problem across all countries, where they are a problem, governments have been able to reduce them when they have chosen explicitly to focus on achieving this goal. Efforts to expand coverage beyond hospital and physician services, or to promote voluntary health insurance through tax subsidies have been mixed across countries, with some evidence of inefficient use of tax subsidies and other policies to promote voluntary insurance alongside publicly financed coverage.

7. Implications for health system efficiency, costs, quality

Lessons Learned

What lessons can we draw from the evidence summarized above and what questions remained unanswered? In terms of collection, many countries are exploring new ways of generating revenues for health care to enable them to cope with significant cost growth. However, there is little evidence to suggest that collection mechanisms alone are effective in managing the cost or quality of care. First, the traditional classification of tax-financed versus social insurance systems does not determine how countries organize health financing functions to achieve policy goals. The evidence available on the relationship between financing and outcomes suggests that health systems financed through social insurance (as opposed to general tax revenues) tend to be more regressive and have smaller tax bases. Some evidence suggests that financing through social insurance versus general tax revenues is associated with higher cost growth over time, although it is difficult, using such a broad classification, to separate collection mechanisms from other characteristics more often found in tax-financed jurisdictions such as budget and price controls and quasi-hard budget constraints. Public health care funding in tax-based systems tends to track GDP more closely than in countries that collect funds through social insurance. Perhaps unsurprisingly, many jurisdictions are moving towards a diversity of funding streams (adding tax-based funding to social insurance) to manage health care expenditure growth and maintain universality. Theory and evidence on cost sharing through standard user fees suggests that for the purpose of revenue collection it is not clear, given the administrative costs involved, that user fees are an optimal means of supplementing taxes and contributions in developed health systems. The evidence on value-based cost sharing (using cost sharing selectively to encourage patients to use medication, services, and providers that offer better value than other options, rather than simply applying user fees across the board) suggests some efficiency improvements in use of care.

European systems with competitive health insurance (historically only found in countries that use social insurance to finance health care) have multiple risk pools, which can lead to selection issues and inefficiencies. All have significantly improved their risk equalization schemes in the last ten years and many now have relatively sophisticated formulas that include health-based risk adjusters. In spite of this, insurers' incentives to select risks are substantial and there continues to be (largely circumstantial) evidence of risk selection and hence potential inefficiencies in risk pooling. In some cases such as Switzerland, the voluntary insurance market seems to exacerbate risk selection and it would make sense to segment these markets to avoid this behavior. Recent evidence from the United States offers two reasons for optimism on this front. The first is that risk adjustment continues to improve and there is evidence that more detailed data on use, coupled with restrictions on ability to change insurer, can significantly mitigate risk selection. As a result, there is likely to continue to be convergence across countries towards better risk selection strategies. Second, recent empirical evidence examining insurance choice by individuals in the United States has found that preferences, in addition to risk, are important determinants of insurance

choice, so the welfare implications of adverse selection by individuals in many markets may be smaller than previously thought.

Where purchasing is concerned, there has been some convergence among OECD health systems towards more use of market-like mechanisms, particularly the adoption of DRGs to pay hospitals. Some countries have also attempted to encourage hospital competition and, more recently, a growing number of countries have tried to link provider payment to performance. The evidence on hospital competition suggests that where outcomes are easily observable or targeted (such as wait times) hospitals compete on price and quality (wait times), leading to improved outcomes. In some cases improvements have been at the expense of quality measures that are more difficult to observe, suggesting that it would be useful to have further comparable, well-defined measures of quality beyond wait times. However, where prices are set administratively, competition has improved productivity and quality. DRG payment also appears to have improved productivity and quality, although its effect on overall system costs is mixed. There is some evidence (mainly from the United Kingdom) of improved physician productivity and patient outcomes following the introduction of P4P, although the evidence also suggests a degree of gaming to maximize financial incentives.

A number of the health systems we explore continue to use wait times as a source of non-price rationing. The evidence on the effects of wait times on health outcomes is mixed, with more recent studies finding negative effects on patient health and readmission rates, and older studies finding little effect on health outcomes. The United Kingdom in particular, and to some extent Canada, have significantly reduced wait times by increasing volumes using forms of DRG funding loosely modeled on US Medicare and through targeted budgets. Wait times are therefore not inherent in tax-financed systems but can be fairly successfully manipulated by policy levers such as targets, DRGs, and non-price competition between hospitals.

Unresolved Questions

Our review has revealed some areas where there is a need for a greater evidence base. First, while efforts to be more systematic about defining the publicly provided or mandated benefits package have increased over the past decade, there is a lack of evidence on how effective these changes have been. Organizations such as NICE in the United Kingdom, the Canadian Agency for Drugs and Technologies, the German Institute for Quality and Efficiency in Health Care, or the French National Health Authority, have emerged in many countries in the last decade, showing how jurisdictions increasingly recognize the importance of economic evaluation of best practice and technologies. However, we found little evidence on the extent to which these bodies have achieved their goals and some evidence to suggest they struggle with implementation.

Efforts in systems such as Canada's to expand coverage beyond hospital and physician services, or to promote voluntary insurance through tax subsidies have been mixed. A combination of tax deductions and subsidies has resulted in high levels of voluntary private insurance coverage for non-publicly financed services but these subsidies have led to substantial and poorly targeted tax

expenditures and continued reliance on the firm as the provider of voluntary coverage. Attempts to provide public coverage selectively to older people have also been expensive, while reforms aimed at re-targeting benefits based on income have lowered public costs and had some positive redistributive consequences. The countries we examine therefore provide evidence of the inefficiencies of tax subsidies and of inefficiencies associated with voluntary insurance alongside publicly financed coverage, but do not provide particularly helpful evidence on the efficient mix of public and private finance.

The past ten to fifteen years have seen high health care cost growth in many countries, including all those reviewed here, with average health care cost growth exceeding the average growth in GDP (Haigst and Kotlikoff, 2005). In considering the success of different health systems in controlling costs, the evidence suggests that while policies that effectively limit demand through rationing and fixed budgets appear still to be effective at holding down costs at a point in time, there has been a discernible shift in policies employed by the countries we review away from these types of cost containment strategies, and away from other strategies that simply shift costs to households, towards policies that focus more on the cost-benefit ratio and efficiency, such as greater use of health technology assessment and activity-based funding with administratively set prices. While there are high hopes that these strategies will produce a more efficient use of health care resource and, ideally, control cost growth, further research is needed to determine the extent to which these policies achieve their goals.

8. Conclusions

This review examines the changing role of government in financing health care outside the United States. It focuses on policy choices made by a number of OECD countries around four financing functions – raising revenue, pooling risk, purchasing services, and making coverage decisions. It reviews the evidence of the effects of these choices on efficiency, costs and quality. In doing so it offers some insight into how nations with universal or near universal health coverage are performing as they grapple with having to finance increased health care costs, seek to avoid risk selection in their insurance pools, and promote efficiency in the purchase and use of health care services at all levels of the system.

Each health system has unique attributes that help explain some of the behavior of providers and patients. Nevertheless, many of the empirical studies reviewed here offer supporting evidence that crosses jurisdictions. Indeed there has been some convergence in policies adopted across countries to improve financing incentives and encourage efficient utilization. In the case of risk pooling, all countries with competing pools are experiencing similar difficulties with selection and are adopting more sophisticated forms of risk adjustment. In the case of hospital competition, the key drivers of success appear to be what is competed on and measurable rather than whether the system is public or private. In the case of both the success of pay for performance and issues resulting from wait times, evidence differs both within and across jurisdictions. However, the evidence does suggest that a number of governments have effectively reduced wait times when they have chosen explicitly to focus incentives on achieving this

goal.

While the United States remains an outlier among OECD countries, a number of policy changes across jurisdictions suggest significant convergence in the role of the state in financing health care. These changes, coupled with the introduction of a universal mandate in the United States, suggest that many of the lessons learned above may apply in the United States as well. Greater government involvement will not prevent significant innovation in incentives for efficient purchasing and provision. Nor will it prevent patients from being able to choose insurer or provider or automatically result in longer wait times for treatment. The evidence also suggests, however, that further government involvement in the health care sector without price or volume controls will not necessarily lead to more use of economic evaluation or to lower growth rates in the cost of care, consequences many people associate with a greater role for the state.

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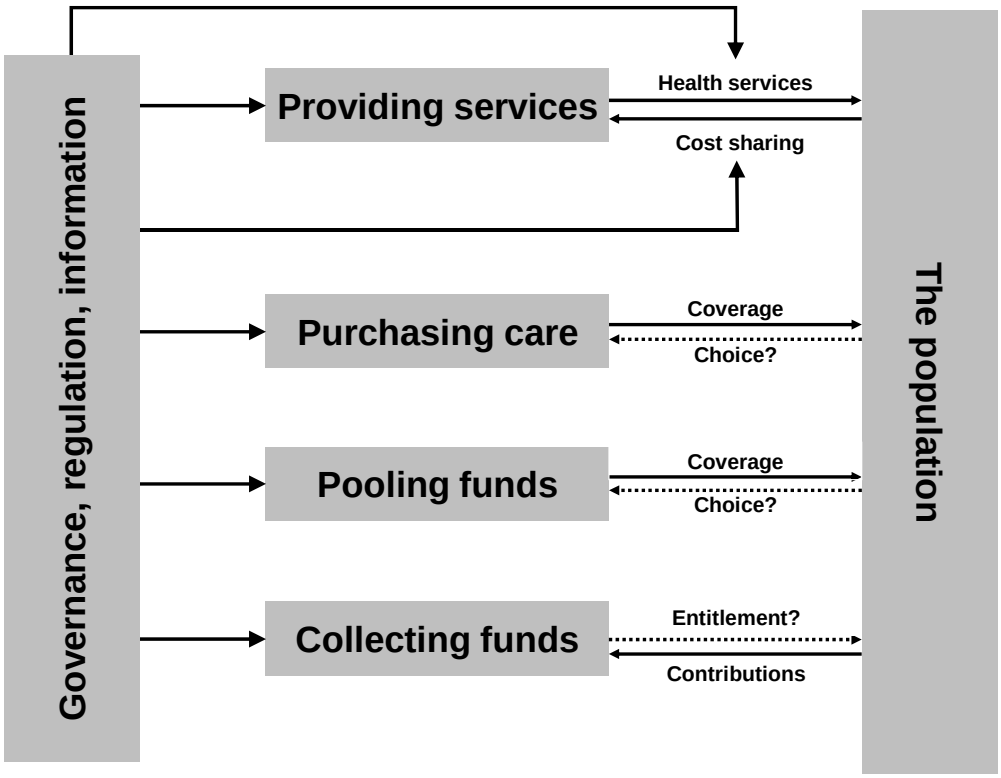
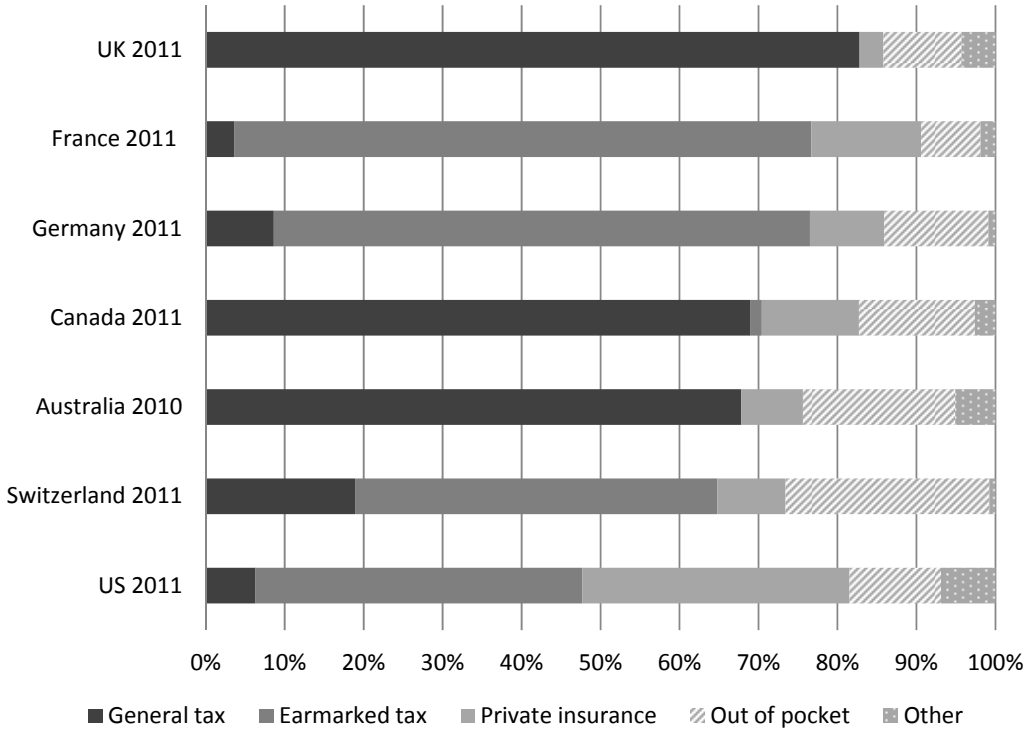
Figure 1: Conceptualizing the Financing Functions of Health Systems



Source: adapted from Kutzin 2001

Figure 2 Breakdown of health financing by expenditure agent



Source: OECD health data 2012

Table 1a Health coverage policy by country, 2013

Coverage	Australia	Canada	England	France	Germany	Switzerland	United States
Breadth: population (% covered in 2011)	100% covered by regionally administered universal program (Medicare)	100% covered by regionally administered universal program (Medicare	100% covered by universal program (National Health Service, NHS)	100% covered by universal program	90% covered by public program; 10% covered by private insurance	100% covered by universal private insurance	31.8% covered by national program for 65+ and some disabled (Medicare) or low-income (Medicaid); 53.1% covered by private insurance; 16% uninsured
Scope: benefits	Benefit decisions made by national government and informed by HTA	Benefit decisions made by regional government in conjunction with doctors and informed by HTA	Benefit decisions made at regional level and informed by HTA at national level	Benefit decisions made at national level and informed by HTA	Benefit decisions mainly made at national level and informed by HTA	Benefit decisions made at national level and informed by HTA	Benefit decisions made nationally (Medicare), regionally (Medicaid) and by individual insurers (private insurance)
Depth: user fees	User fees for outpatient services including prescriptions. No cap on user fees.	No user fees for publicly covered benefits. No cap on user fees.	User fees for outpatient prescriptions. Capped at £104 per year for people needing a large number of prescription drugs	User fees widely applied. No cap on user fees.	User fees for outpatient prescriptions. Capped at 2% income or 1% income for chronically ill or low income	User fees widely applied. Capped at CHF 700 CHF after deductible.	User fees widely applied. No cap on user fees.
VHI role	~50% buy coverage for	~67% buy coverage for non-	~11% buy for	~90% buy or receive government	Cost-sharing + amenities (~20%);	Majority buy for non-covered	Non-covered

	private hospital costs and non-covered benefits	covered benefits	private facilities	vouchers for cost-sharing; some non-covered benefits	Substitute: 10% opt out of SHI system for private coverage only	benefits and amenities	Medicare benefits

Sources: OECD health data 2012, Thomson et al 2012

Note: HTA = health technology assessment; SHI = statutory health insurance; VHI = voluntary/private health insurance

Table 1b Key health financing functions by country (publicly financed benefits), 2013

Function	Australia	Canada	England	France	Germany	Switzerland	United States
Collection							
Revenue sources	General tax revenue; earmarked income tax	Provincial/federal tax revenue	General tax revenue (includes employment-related contributions)	Employer/employee earmarked income and payroll tax; general tax revenue, earmarked taxes	Employer/employee earmarked payroll tax; general tax revenue	Community-rated insurance premiums; general tax revenue	Medicare: payroll tax, premiums, federal tax revenue; Medicaid: federal, state tax revenue
Contributions	**Not applicable**	**Not applicable**	**Not applicable**	**Centrally set; dependants covered at no extra cost**	**Centrally set; dependants covered at no extra cost**	**Insurers set premiums; dependants must purchase own cover; premium subsidies set by Cantons**	**Medicare: centrally determined**
Pooling							
Nature of purchasing agent	National government agency	Non-competing regional government agencies	Non-competing regional statutory bodies	Non-competing regional statutory agencies	Competing non-governmental non-profit insurers and competing private insurers	Competing private insurers	Competing private insurers
Risk adjustment for competing insurers	Not applicable	Not applicable	Not applicable	Not applicable	For publicly financed benefits	For publicly financed benefits	For publicly financed benefits

Purchasing services							
Patient choice of primary care provider	Yes; gatekeeping required	Yes; gatekeeping incentivized in some regions	Yes, within a region; gatekeeping required	Yes; gatekeeping incentivized	Yes; gatekeeping incentivized	Yes; some plans incentivize gatekeeping	Usually; some plans incentivize gatekeeping
Patient choice of hospital	Yes	Yes, through GP	Yes	Yes	Yes	Yes	Usually
Primary care and ambulatory specialist provider payment	Private: FFS	Private: FFS/capitation/mixed	Private: mix of capitation, FFS and P4P; salary for a minority	Private: FFS	Private: FFS	Private: most FFS but some capitation	Private: most FFS, some capitation
Hospital payment	Public beds (67%): global budgets + DRGs Private: FFS	Public and private non-profit: global budgets + DRGS in some provinces	Public: mainly DRGs and service contracts	Public and private non-profit: mainly DRGs and grants	Public beds (50%), private non-profit (33%), private for profit: global budgets + DRGs	Public varies by Canton: global budgets, per diem, DRGs	Private non-profit (70%), public (15%), private for profit: per diem + DRGs
P4P	Primary care and hospitals	No	Primary care and hospitals	Primary care, ambulatory specialists and hospitals	Primary care	No	Primary care, ambulatory specialists and hospitals

Sources: Cashin et al in press, Thomson et al 2012

Note: DRG = diagnosis-related group; FFS = fee-for-service; P4P = pay for performance

Table 2: Selected empirical papers reviewed: Raising Revenue

Author	Title	Time Period	Country Covered	Findings
Wagstaff, 2009	"Social Health Insurance vs. Tax-Financed Health Systems – Evidence from the OECD," *World Bank Policy Research Paper*	1960-2006	OECD countries	Adopting SHI (vs tax financing) increases per capita health spending; reduces the formal sector share of employment & total employment; has no impact on amenable mortality; but performs worse for breast cancer among women
Wagstaff and Moreno-Serra, 2009	"Europe and Central Asia's great post-communist social health insurance experiment: impacts on health sector outcomes." *Journal of Health Economics*	1990-2004	Central and Eastern Europe & Central Asia (28 countries)	Adopting SHI (from tax financed) increased national health spending and hospital activity rates, but did not lead to better health outcomes
Finkelstein, 2002	Finkelstein, A., "The effect of tax subsidies to employer-provided supplementary health insurance: evidence from Canada," *Journal of Public Economics*	1991-1994	Canada	Reducing tax subsidy to employer-provided health insurance (HI) decreased coverage by one fifth
Stabile, 2001	"Private Insurance	1994-1996	Canada	Removing tax exemptions to

	Subsidies and Public Health Care Markets: Evidence From Canada," *Canadian Journal of Economics*			employer provided HI would cause levels of supplemental HI to decline by roughly 20 per cent.
Buchmueller et al., 2004	"Access To Physician Services: Does Supplemental Insurance Matter? Evidence From France." *Health Economics*	1998	France	Individuals with insurance: have more physician visits than those without, but are no more likely to visit a specialist.
Gertler and Hammer, 1997	Strategies for Pricing Public Provided Health Services," *Policy Research Working Paper*	Not reported	Review article: multiple countries, mostly non-OECD	User fees are important in co-financing health care but should not be the primary means of finance, and should not be applied uniformly - or the wealthy will benefit and the poor will suffer
Grootendorst and Stewart, 2006	"Impact of Reference Pricing on Anti-Hypertensive Drug Plan Expenditures," *Health Economics*	1994-2000	Canada	The apparently modest program savings attributable to Reference Pricing (RP) can be traced back to the design of the policy i.e. factors other than RP
Goldman et al., 2007	Prescription Drug Cost Sharing: Associations with medication and medical	Not reported	Review article: multiple countries incl. USA, Europe & Canada	Increased cost sharing is associated with lower rates of drug treatment, worse adherence among

	utilization and spending and health," *Journal of the American Medical Association*			existing users, and more frequent discontinuation of therapy
Tamblyn et al., 2001	"Adverse Events Associated With Prescription Drug Cost-Sharing Among Poor and Elderly Persons" J*ournal of the American Medical Association*	1993-1997	Canada	Adopting cost-sharing decreased use of essential & less essential drugs, increased rate of serious adverse events & emergency department visits, in elderly persons and welfare recipients

Table 3: Selected empirical Papers Reviewed: Pooling Risk

Author	Title	Time Period	Country Covered	Findings
Gress et al., 2002	"Free Choice of Sickness Funds in Regulated Competition: Evidence from Germany and the Netherlands," *Health Policy*	1992-2001	Germany & The Netherlands	Consumers changing sickness funds depends strongly on economic incentives, especially with regard to the extent of financial risk sickness funds have to bear and to the extent premiums or contribution rates can differ.
Knaus and Nuscheler, 2005	"Risk selection in the German public health insurance system." *Health Economics*	1995 - 2000	Germany	Success of company-based sickness funds originates in incomplete risk adjustment and the negative correlation between health status and switching costs
Dormont et al., 2009	"The influence of supplementary health insurance on switching behaviour: evidence from Swiss data." *Health Economics*	1996 to 2005	Switzerland	Holding SI decreases propensity to switch, but is not significant when self-assessed health is "very good"; to the contrary, holding an SI contract significantly reduces propensity to switch when the individual's subjective health status deteriorates
Frank and Lamiraud, 2009	"Choice, price competition and complexity in	1997-2000	Switzerland	As the number of choices grow responsiveness to

	markets for health insurance." *Journal of Economic Behavior & Organization*			price declines allowing large price differentials to persist holding constant plan and population characteristics
Thomson et al., 2013	"Statutory health insurance competition in Europe: a four-country comparison", *Health Policy*		Belgium, Germany, the Netherlands & Switzerland	Health Insurers (HI) / provider collective negotiation in Belgium, Germany and Switzerland curbs HI's' ability to influence quality and costs. Despite Dutch HI's access to efficiency-enhancing tools, data and capacity constraints and stakeholder resistance limit their use.
van de Ven et al., 2007	"Risk Adjustment and Risk Selection in Europe: Six Years Later." *Health Policy*	2000–2006	Belgium, Germany, Israel, the Netherlands &Switzerland	Despite risk adjustment systems' improvement, all five countries show increasing risk selection, which increasingly becomes a problem, in particular in Germany and Switzerland
Paolucci et al., 2006	"Supplemental Health Insurance as a Tool for Risk Selection in Mandatory Health Insurance Markets," Health	2000-2008	Switzerland	Combining universal access and consumer choice of HI's is implemented. Challenge: create integrated delivery systems for high-

	Economics, Policy, Law			quality care in response to consumers' preferences
Lehmann and Zweifel, 2004	"Innovation and Risk Selection in Deregulated Social Health Insurance." *Journal of Health Economics*	1997 -2000	Switzerland	The managed care plans benefit from risk selection effects. In the case of the Health Maintenance Organization (HMO) plan, however, the pure innovation effect may account for as much as two-third of the cost advantage.
Brown et al., 2011	"How Does Risk Selection Respond to Risk Adjustment? Evidence from the Medicare Advantage Program," NBER Working Paper	1994 - 2006	USA	Firms reduce selection along dimensions included in the risk-adjustment formula, while increasing selection along excluded dimensions. Government's differential payments rise after risk adjustment.
Newhouse et al., 2012	"Steps to Reduce Favorable Risk Selection in Medicare Advantage Largely Succeeded, Boding Well For Health Insurance Exchanges," *Health Affairs*	2003 - 2008	USA	Policies—an improved risk adjustment formula and a prohibition on monthly disenrollment by beneficiaries—largely succeeded in reducing favorable selection in Medicare Advantage.
Colombo, F,	"Towards More	1996 -	Switzerland	Measures to improve

2001	Choice in Social Protection? Individual Choice of Insurer in Basic Mandatory Health Insurance in Switzerland," *OECD*	2000		switching should be accompanied by interventions to foster competition on quality and efficiency rather than on risk selection. Promoting increase in switching rates might otherwise come at a higher price than the benefits.

Table 4: Selected empirical Papers Reviewed: Purchasing Services

Author	Title	Time Period	Country Covered	Findings
Gravelle et al., 2010	"Doctor Behaviour Under Pay For Performance Contracting: Treating, Cheating and Case Finding?" *The Economic Journal*	2004-2006	UK	Differences in reported disease rates between providers, and differences in exception rates both between and within providers, suggest gaming
Palangkaraya, A., Yong, J. 2013	"Effects of Competition on Hospital Quality: An Examination Using Hospital Administrative Data," *European Journal of Health Economics*	2000 - 2005	Australia	Hospitals facing higher competition have lower unplanned admission rates. However, competition is related negatively to hospital quality when measured by mortality, albeit the effects are weak and barely statistically significant.
Campbell et al., 2007	"Quality of Primary Care in England with the Introduction of Pay for Performance," *New England Journal of Medicine*	1998 - 2005	UK	Introduction of pay for performance was associated with a modest acceleration in improvement for diabetes and asthma but not for coronary heart disease
Serumaga et al., 2011	"Effect of pay for performance on the management and outcomes of	2000 - 2007	UK	Pay for performance had no discernible effects on processes of care or on

	hypertension in the United Kingdom: interrupted time series study." *BMJ*			hypertension related clinical outcomes. Generous financial incentives may not be sufficient to improve quality of care and outcomes for hypertension and other common chronic conditions
Sutton et al., 2012	"Reduced Mortality with Hospital Pay for Performance in England," *the New England Journal of Medicine*	2006 - 2010	UK	Pay for performance was associated with a clinically significant reduction in mortality
Duggan, 2004	"Does contracting out increase the efficiency of government programs? Evidence from Medicaid HMOs," *Journal of Public Economics*	1989 - 2000	USA	HMO enrolment and the resulting switch from fee-for-service to managed care was associated with a substantial increase in government spending but no corresponding improvement in infant health outcomes
Rosenthal and Frank, 2006	"What is the empirical basis for paying for quality in health care?" *Medical Care Research and Review*	1975 - 2004	USA	There is little evidence to support the effectiveness of paying for quality.
O'Reilly et al., 2012	"Paying for hospital care: the experience with	1990s & 2000s	England, Finland, France,	Activity-based funding has been associated with an

	implementing activity-based funding in five European countries." *Health Economics, Policy and Law*		Germany & Ireland	increase in activity, a decline in length of stay and/or a reduction in the rate of growth in hospital expenditure in most of these countries
Bevan and van de Ven, 2010	"Choice of Providers and Mutual Healthcare Purchasers: Can the English National Health Service Learn from the Dutch Reforms?" *Health Economics, Policy and Law*	Mid-1970s - 2010	UK & the Netherlands	Effectively implementing the fully competitive Dutch model requires preconditions to be fulfilled: a good risk equalization system, an effective competition policy, an adequate system of product classification and medical pricing and transparent consumer information on the HI products and on the quality of health care providers.
Le Grand, 1999	"Competition, Cooperation or Control? Tales from the British National Health Service," *Health Affairs*	1990s	UK	Creation of an internal or quasi-market, separating purchaser from provider and encouraging competition among providers, had minimal effect, partly because of retention of central control and partly inadequate understanding of professional motivations
Propper et al.,	"Does	1990s	UK	Greater competition is

2004	Competition Between Hospitals Improve the Quality of Care? Hospital Death Rates and the NHS Internal Market." *Journal of Public Economics*			associated with higher death rates, controlling for patient mix and other characteristics of the hospital and catchment. However, the estimated impact of competition is small
Propper et al., 2008	"Competition and Quality: Evidence From the NHS Internal Market 1991-9." *Economic Journal*	1991-1999	UK	Relationship between competition and AMI mortality (as a measure of quality) is negative. We also find that competition reduced waiting times. Indication is that hospitals in competitive markets reduced unmeasured and unobserved quality in order to improve measured and observed waiting times.
Dusheiko et al., 2006	"The Effect of Financial Incentives on Gatekeeping Doctors: Evidence From a Natural Experiment." Journal of Health Economics	1991-1999	England	The abolition of fundholding increased ex-fundholders' admission rates for chargeable elective admissions
Dixon et al., 2010	"The Experience of Implementing	1990s – 2000s	England and the	Similar challenges have been faced.

	Choice at Point of Referral: A Comparison of the Netherlands and England." *Health Economics, Policy and Law*		Netherlands	Although changes have the potential to generate improvements and benefits (eg. convenience, certainty and choice for patients and efficiency gains) they have also generated problems during implementation including GP resistance
Gaynor et al., 2010	Death By Market Power Reform, Competition and Patient Outcomes in the National Health Service." *NBER Working Paper*	2003 - 2007	UK	Effect of competition is to save lives without raising costs. Patients discharged from hospitals located in markets where competition was more feasible were less likely to die, had shorter length of stay and were treated at the same cost
Gaynor et al., 2012	"Free to Choose? Reform and Demand Response in the English National Health Service," *NBER Working Paper 18574*	2003 - 2008	UK	Demand elasticity increases with choice, and there is substantial heterogeneity in consumer response. More severely ill patients become more sensitive to quality of care post-reform.
Duggan and Scott Morton, 2010	"The Effect of Medicare Part D on	2001 - 2006	USA	Part D substantially lowered the average price and increased

	Pharmaceutical Prices and Utilization," *American Economic Review*			the total utilization of prescription drugs by Medicare recipients. The magnitude varies across drugs.
Cheng et al, 2012	"What Factors Influence the Earnings of General Practitioners and Medical Specialists? Evidence from The Medicine in Australia: Balancing Employment and Life Survey," *Health Economics*	2008	Australia	Earnings of GPs are lower (vs. specialists) because GPs work fewer hours, are more likely to be female, are less likely to undertake after-hours or on-call work, and have lower returns to experience.
Cooper et al, 2010	""Does hospital competition save lives? Evidence from the English NHS patient choice reforms" *LSE working paper*	2002 - 2008	England	Post-reforms mortality fell (i.e. quality improved) for patients living in more competitive markets.
Savage, E., Wright, D., 2003	"Moral Hazard and Adverse Selection in Australian private hospitals: 1989-1990," *Journal of Health Economics*	1989 – 1990	Australia	When the endogeneity of the insurance decision is accounted for, the extent of moral hazard can substantially increase the expected length of a hospital stay by a factor of up to 3

Table 5: Selected empirical Papers Reviewed: Coverage Decisions

Author	Title	Time Period	Country Covered	Findings
Propper et al., 2002	"Waiting Times for Hospital Admissions: the Impact of GP Fundholding." *Journal of Health Economics*	1993 - 1997	UK	Patient waiting time reductions were secured where doctors paid for their patients' care, but not where doctors chose hospitals only and did not pay.
Siciliani and Martin, 2007	"An Empirical Analysis of the Impact of Choice on Waiting Times." *Health Economics*	1999 – 2001.	England	More choice is significantly associated with lower waiting times at the sample mean (five hospitals) although the effect is modest, also some evidence that this improves with more choice (i.e. more than 11 hospitals in catchment).
Cooper et al., 2009	"Equity, Waiting Times, and NHS Reforms: Retrospective Study." *British Medical Journal*	1997- 2007	England	Waiting times for patients having elective hip replacement, knee replacement, and cataract repair in England reduced, as did variation in waiting times across socioeconomic groups
Propper et al., 2010	"Incentives and Targets in Hospital Care: Evidence from a Natural Experiment,"	1997 - 2004	England & Scotland	The English policy of setting targets for elective care waiting times achieved its objectives: the length of time patients

	Journal of Public Economics			waited fell and admissions for elective care rose.
Wilcox et al., 2007	"Measuring and Reducing Waiting Times: A Cross-National Comparison of Strategies," *Health Affairs*	2000 - 2005	Australia, Canada, England, New Zealand, & Wales	England has achieved the most sustained improvement, linked to major funding boosts, ambitious waiting-time targets, and a rigorous performance management system. While supply-side strategies are used in all five countries, New Zealand and parts of Canada have also invested in demand-side strategies (use of clinical criteria to prioritize access to surgery)
Hamilton et al., 1996	"What are the costs of queuing for hip fracture surgery in Canada?" *Journal of Health Economics*	1990 - 1993	Canada	Pre-surgery delay (for hip fracture) has little effect on either post-surgery length of stay in hospital and inpatient mortality
Carrier et al., 1993	"Outcome of rationing Access to Open Heart Surgery," *Canadian Medical Association Journal*	1991 - 1992	Canada	Pre-surgery wait (elective open-heart surgery) had no effect on patient outcome after surgery.
Guttmann et al., 2011	"Association between waiting times and short	2003 - 2007	Canada	Presenting to an emergency department during

	term mortality and hospital admission after departure from emergency department: population based cohort study from Ontario, Canada," *BMJ*			shifts with longer waiting times, reflected in longer mean length of stay, is associated with a greater risk in the short term of death and admission to hospital in patients who are well enough to leave the department
Einav, Finkelstein and Levin, 2010	"Beyond Testing: Empirical Models of Insurance Markets," *Annual Review of Economics*	2000s	USA	Recent advances in empirical models of insurance have yielded insights into the nature of consumer heterogeneity and the possibility that certain kinds of welfare losses from asymmetric information, at least in some insurance markets, may be modest.
Finkelstein and McGarry, 2006	"Multiple Dimensions of Private Information: Evidence from the Long-Term Care Insurance Market," *American Economic Review*	1995 - 2000	USA	Insurance markets may suffer from asymmetric information even absent a positive correlation between insurance coverage and risk occurrence
Fange et al., 2008	"Sources of Advantageous	1991 - 2002	USA	Evidence of advantageous

	Selection: Evidence from the Medigap Insurance Market," *Journal of Political Economy*			selection in the Medigap insurance market. Its sources include income, education, longevity expectations, financial planning horizons, and cognitive ability.
Bolin et al., 2010	Asymmetric information and the demand for voluntary health insurance in Europe," *NBER Working Paper*	2004	Austria, Belgium, Denmark, France, Germany, Greece, Italy, Spain, Sweden, & Switzerland	Correlation between risk and insurance was negative, but no evidence of heterogeneous risk-preferences as an explanation
Einav, Finkelstein and Cullen, 2010	"Estimating Welfare in Insurance Markets Using Variation in Prices," *Quarterly Journal of Economics*	2004	USA	Find adverse selection in employer provided HI, however estimate that the quantitative welfare implications associated with inefficient pricing in the particular application are small, in both absolute and relative terms.
Einav and Finkelstein, 2011	"Selection and Asymmetric Information in Insurance Markets," *NBER Reporter*	N/A	USA & Israel (review of other studies)	While private information about risk plays an important role in insurance demand in USA, another dimension of heterogeneity - risk aversion - may be just as important, or even more so.
Alan et al.,	"Distributional	1969 -	Canada	While program effects

2005	Effects of General Population Prescription Drug Programs in Canada," *Canadian Journal of Economics*	1996		are muted when there are high deductibles, a non-senior prescription drug subsidy is more redistributive than an equal-cost proportional income transfer, partly because of differential private HI coverage by income.
Hanley et al., 2007	"Distributional Consequences of the Transition from Age Based to Income Based Prescription Drug Coverage in British Columbia, Canada," *Health Economics*,	2000 - 2004	Canada	Pharmaceutical financing became less regressive after the policy change. Results suggest that if the public financing of pharmaceuticals were maintained or increased, a change from age-based to income-based eligibility can unambiguously improve equity in finance
Smart and Stabile, 2005	"Tax Credits, Insurance, and the Use of Medical Care," *Canadian Journal of Economics*	1986 - 2000	Canada	Evidence of greater tax price elasticities (vs. traditional point-of-service price elasticity estimates), but no evidence tax subsidy affects HI demand on the intensive margin
Stabile, 2002	"The Role of Tax Subsidies in the Market for Health	1995	Canada & USA	Tax subsidies encourage the provision of HI in

	Insurance," *International Tax and Public Finance*			smaller firms. Removal of them would cause the HI level in small (but not larger) firms to decline significantly.
Hurley et al, 2002	"Parallel Private Health Insurance in Australia: A Cautionary Tale and Lessons for Canada." *Institute for the Study of Labor Research*	1995 - 2001	Australia	Very limited cost savings; public system wait times unlikely to reduce; regulation complex; independent system of private finance not possible; quality plays a key role in driving the dynamics between the public and privately financed sectors; clear policy objectives are essential
Johar et al. 2011	"Waiting Times for Elective Surgery and the Decision to Buy Private Health Insurance," *Health Economics*	2004 - 2005	Australia	Expected waiting time does not increase the probability of buying insurance but a high probability of experiencing a long wait does. On average, waiting time has no significant impact on insurance.
Johar and Savage, 2010	"Do Private Patients Have Shorter Waiting Times for Elective Surgery: Evidence from New South Wales Public Hospitals"	2004 - 2005	Australia	Private patients have shorter waiting times, and tend to be admitted ahead of their listing rank, especially for procedures that have low urgency levels.

	Economic Papers			